Application No. 10/762,165
Reply to Office Action dated January 4, 2006
Amendment dated February 3, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended): An apparatus ~~self-clutching O-ring for supporting substrates~~ comprising:

an O-ring structure having at least two internally disposed struts, each strut connectively extending to a centrally disposed sphere retainer, the struts having an upper surface and a lower surface; and

~~the upper surface of the struts are formed below the O-ring surface.~~

a sphere-shaped retaining insert ~~is~~ connectively formed below the ~~bottom~~ lower surface of the struts.

2. (Currently Amended): The ~~self-clutching O-ring~~ apparatus of claim 1, ~~and~~ further comprising:

a structure having a ~~circular~~ recess for supporting and containing the O-ring.;

the ~~circular~~ recess having a spherical hole disposed on its center for removeably inserting the sphere-shaped retainer of the O-ring.

3. (Currently Amended): The ~~self-clutching O-ring~~ apparatus of claim 1, wherein the O-ring is molded using an elastomeric polymer material that is compatible with a substrate to be supported.

4. (Currently Amended): The ~~self-clutching O-ring~~ apparatus of claim 1, wherein the O-ring is ~~used~~ adapted for supporting substrates during high speed handling and processing of the substrates.

5. (Currently Amended): The ~~self-clutching O-ring~~ apparatus of claim 1, wherein the O-ring ~~retains~~ is adapted to retain a supporting substrate by ~~is~~ its frictional properties.

6. (Currently Amended): The ~~self-clutching O-ring~~ apparatus of claim 1, ~~wherein~~ the ~~circular~~ recess ~~having~~ has a dovetailed edge, and the dovetailed edge combined with the ~~sphere-shaped~~spherical hole prevents ~~and~~ an O-ring from lifting with the substrate caused by stiction properties of elastomeric materials.

7. (Currently Amended): The ~~self-clutching O-ring~~ apparatus of claim 1 ~~reduces processor downtime caused by particulate contamination and substrate breakage resulting from missing O-rings.~~, wherein the upper surface of each strut is horizontally disposed below an upper surface of the O-ring.

8. (Cancelled)

9. (Currently Amended): ~~A self retaining O-ring pad~~An apparatus ~~for supporting semiconductor wafers~~ comprising:

an O-ring ~~pad arrangement~~structure having an upper surface and having at least two internally disposed struts,

each strut connectively extending to a centrally disposed sphere retainer,

the~~each~~ ~~struts~~ strut having an upper surface and a lower surface,~~;~~

the upper surface of ~~the struts~~each strut ~~is are~~ being formed below the upper surface of the O-ring ~~surface.~~; and

a sphere-shaped retaining insert ~~is~~ connectively formed below the bottom surface of the struts.

10. (Currently Amended): The ~~self retaining O-ring pad~~ apparatus of claim ~~1~~ 2, ~~and~~ wherein the recess has a vent hole disposed therein, the vent hole being disposed ~~further comprising:~~

~~a circular recess for supporting and containing the O-ring;~~

~~the circular recess having a spherical hole disposed on its center for removeably inserting the sphere-shaped retainer of the O-ring.~~

~~the circular recess has a vent hole radially disposed halfway~~ between the spherical hole and the inside surface of the ~~circular~~ recess.

11. (Currently Amended): The ~~self retaining O ring pad~~ apparatus of claim 9, wherein the O-ring ~~pad~~ is molded using an elastomeric polymer material that is compatible with a supported wafer.

12. (Currently Amended): The ~~self retaining O ring pad~~ apparatus of claim 9, wherein the O-ring ~~pad~~ is ~~used~~ adapted for supporting semiconductor wafers during high speed handling and processing of the wafers.

13. (Currently Amended): The ~~self retaining O ring pad~~ apparatus of claim 9, ~~where~~ ~~in~~wherein the O-ring is adapted to ~~pads~~ retain a supporting wafer by its frictional properties.

14. (Currently Amended): The ~~self retaining O ring pad~~ apparatus of claim 9, ~~where~~ ~~in~~wherein the sphere-shaped retainer in combination with the struts prevents ~~an~~ the O-ring ~~pad~~ from lifting upwards with the wafer, and the lifting is caused by stiction properties of an elastomeric material.

15. (Cancelled)

16. (Cancelled)

17. (Withdrawn): A method for retaining O-ring pads for supporting semiconductor wafers, comprising the steps of:

providing a robot with a wafer-handling paddle;

providing a paddle with a plurality of circular recesses, each circular recess contains and supports an O-ring pad, the circular recesses having a dovetailed periphery and a spherical hole disposed on its center, and a vent hole radially disposed halfway between the spherical hole and the inside surface of the circular recess.

providing an O-ring pad having at least two internally disposed struts connectively extended to a centrally disposed sphere-shaped retainer, the struts having an upper and a lower surface;

the top surfaces of the struts are formed below top surfaces of the O-ring pad.

the sphere-shaped retainer is connectively formed below the bottom surfaces of the struts;

placing the O-ring pad on each of the circular recesses while conforming it to the dovetailed periphery and removeably urging the sphere-shaped retainer into the spherical hole.

18. (Withdrawn): The method of claim 17 wherein the O-ring pads are molded using an elastomeric polymer material that is compatible with a supported wafer.

19. (Withdrawn): The method of claim 17 wherein the O-ring pad is used for supporting semiconductor wafers during high speed handling and processing of the wafers.

20. (Withdrawn): The method of claim 17 wherein the O-ring pad retains a supporting wafer by its frictional properties.

21. (Withdrawn): The method of claim 17 wherein the sphere-shaped retainer in combination with the struts prevents an O-ring pad from lifting upwards with the wafer, the lifting is caused by stiction properties of an elastomeric material.

22. (Withdrawn): The method of claim 21 wherein a conventional O-ring stuck to the bottom of a wafer may be carried into a high temperature process chamber thus contaminating the process environment.

23. (Withdrawn): The method of claim 17 wherein the self clutching O-ring pad reduces processor downtime caused by contamination and substrate breakage resulting from a missing O-ring support.

24. (Withdrawn): The method of claim 17 wherein utilization of the self-clutching O-ring pad is highly reliable and more serviceable equipment solution.

25. (New): An apparatus comprising:

an O-ring structure having an upper surface, a lower surface and a central axis, the upper surface configured to releasably support a substrate;

a transfer paddle having a recess wall defining a recess, the recess configured to receive the O-ring structure;

at least two struts disposed internally on the O-ring structure, each strut connected to the central axis of the O-ring structure, each strut having an upper surface and a lower surface; and

a sphere-shaped retaining insert centrally disposed within the O-ring structure and connected below the lower surface of each strut.

26. (New): The apparatus of claim 25, wherein the upper surface of each strut is horizontally disposed below the upper surface of the O-ring structure.

27. (New): The apparatus of claim 25, wherein the recess of the transfer paddle has a spherical shape for supporting and containing the O-ring structure.

28. (New): The apparatus of claim 25, wherein the recess wall of the transfer paddle is configured with a dovetailed edge for preventing the O-ring structure from lifting with a substrate during a transfer of the substrate from the apparatus to a substrate transport device.

29. (New): The apparatus of claim 25, wherein the recess of the transfer paddle has a spherical hole centrally disposed therein, the spherical hole configured for the insertion of the sphere-shaped retaining insert of the O-ring structure.

30. (New): The apparatus of claim 29, wherein the recess of the transfer paddle has a vent hole disposed therein, the vent hole being disposed between the spherical hole and the recess wall.

31. (New): The apparatus of claim 25, wherein the O-ring structure is made of an elastomeric polymer material that is compatible with a substrate to be supported.

32. (New): The apparatus of claim 25, wherein the O-ring structure is adapted to retain a supported substrate by frictional properties thereof.